

REMARKS

Applicant acknowledges with appreciation that Examiner has provided a *Response to Arguments* regarding previously submitted arguments pertaining to the suggested combination of the *Hunt* and *Vickers* references. Applicant respectfully asserts that not all of Applicant's arguments were fully considered as reflected in the recently received final office action. Claims 1-11 and 13-25 are pending. Applicant respectfully requests reconsideration and reexamination of the application based on the following arguments.

Claims 1-11 and 13-25 were rejected under 35 U.S.C. § 103(a) as being obvious over J.H. HUNT and R.B. HOLMES, *Observation of Optical response of Avalanche Photodiodes at Photon-Counting Light Levels*, Journal, May 30, 1994, 3pgs., Appl. Phys. Lett. 64 (22) [herein referred to as "*Hunt*"] in view of U.S. Patent No. 6,720,588 to *Vickers*. Applicant respectfully traverses this rejection in its entirety.

In summary, Applicant respectfully submits that a prima facie case for obviousness is not made, and that even if the references are combined as suggested, they still do not teach all the claimed elements of the present invention.

Specifically, in the final office action a first portion of the *Response to Arguments* section includes:

Examiner asserts that while the particular application and embodiment of *Vickers* may differ from *Hunt*, the underlying principle and objective of

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detecting single photons using an avalanche photodiode is shared by both the *Hunt* and *Vickers* references. Since the use of the particular InGaAsP material for an avalanche photodiode is taught by *Vickers*, the knowledge of such materials to be combined with *Hunt* is proper. Examiner further asserts that "it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice." See *In re Leshin*, 125 USPQ 416 (CCPA 1960)

Applicant respectfully submits, based on a more recent case, the mere fact that references can be combined or modified as suggested does not render the resultant combination obvious unless the cited references also suggest the desirability of the suggested combination. See MPEP 2143.01 and *In Re Mills* 16 USPQ2d 1430 (Fed. Cir. 1990). Since there is no teaching or suggestion in either reference for the application of an InGaAsP avalanche photodiode (APD) with "the avalanching electrons resulting in a photorefractive response which changes the index of refraction in the photodiode" as claimed substantially in claims 1, 14, 22, and 25, Applicant respectfully asserts that there is no motivation to combine the references as suggested, nor is there any suggestion in the references themselves as to the desirability of such a combination.

Examiner appears to assert the combination is proper because the "underlying principle and objective of detecting single photons using an avalanche photodiode is shared by both the *Hunt* and *Vickers* references". Applicant traverses this

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assertion since *Vickers* does not teach the InGaAsP photodiode provides a "photorefractive response which changes the index of refraction" nor the application of an InGaAsP photodiode to the capture of "light reflected from the photodiode", as claimed substantially in claims 1, 14, 22, and 25. Further, *Vickers* teaches away from a combination with *Hunt* since *Vickers* teaches the frequency response is undesirably low for the custom avalanche photodiode (APD) detector having a  $k$  value near one as intended, making the *Vickers* APD unsuitable for use as claimed substantially in claims 1, 14, 22, and 25 (*Vickers* col. 6 lines 10-14 and Figure 2b).

In contrast, the present disclosure teaches converting an input optical signal at a first wavelength to an output optical signal at a second wavelength in time ranges on the order of 1 nanosecond (Specification para. [0030] lines 10-13). A person of ordinary skill in the relevant art would not be led to combine the references as suggested since the frequency response is undesirably low for the *Vickers* APD with  $k$  value near 1. Instead, a person of ordinary skill in the relevant art would understand *Vickers* teaches away from such a combination, or would not be selectable for such a combination and claimed application. In reference to Examiner's *Response to Arguments*, the obviousness of selecting known plastics as a mechanical element to construct the container-dispenser at issue in the case of *In re Leshin* is not relevant to the

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selection of unpredictable, complex materials such as an InGaAsP photodiode in an electronic device or method as claimed.

Examiner asserted "Since the use of the particular InGaAsP material for an avalanche photodiode is taught by Vickers, the knowledge of such materials to be combined with Hunt is proper". Applicant respectfully traverses this assertion since mere knowledge of a possible combination of elements is not a motivation to combine the elements without a reasonable expectation of success. See *In re O'Farrell* 7USPQ2d 1673 and *In re Tomlinson* 150 USPQ 623 which both held that "obvious to try" is not adequate as a motivation to combine. Further, there is no suggestion in either reference that an InGaAsP photodiode would be successful in producing the "photorefractive response which changes the index of refraction in the photodiode" as claimed.

Examiner further asserts "it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice" based on *In re Leshin*, 125 USPQ 416 (CCPA 1960). Applicant respectfully traverses this assertion since there is no teaching for the suitability of using an InGaAsP diode to provide "a photorefractive response which changes the index of refraction in the photodiode", nor capturing "light reflected from the

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photodiode", as claimed substantially in claims 1, 14, 22, and 25. Applicant asserts that the use of InGaAsP diode cannot be considered an obvious design choice in the absence of a suggestion in the references as to the alleged suitability of such a design choice.

In the final office action, a second portion of the Examiner's *Response to Arguments* section includes:

Applicant also appears to argue that combining the disclosed invention of Vickers with Hunt is improper and cites portions of Vickers that Applicant considers as improper for modification of the Vickers invention. Examiner asserts that the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller* 208 USPQ 871 (CCPA 1981)

Applicant traverses the assertion that Applicant has argued combining the disclosed invention of Vickers with Hunt based on an alleged modification of the Vickers invention. Instead, Applicant has argued that there is no motivation to combine the InGaAsP photodiode (detector element) taught by Vickers with the Hunt reference, and that Vickers does not teach a first and a second source of photons incident upon the APD, does not teach a photorefractive response for the InGaAsP photodiode, nor does Vickers teach or suggest capturing light reflected by the APD, as claimed substantially in claims 1, 14, 22, and 25.

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Finally, in discussing the test for obviousness, Examiner has asserted "the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art" *In re Keller* (208 USPQ 871). Applicant respectfully submits that it is improper to consider the combined teaching of any references where there is no motivation to combine the references in the first place, as discussed above. Further, since the *Vickers* reference actually teaches away from a combination with *Hunt*, Applicant respectfully submits there can be no proper consideration of what the combined references teach since there can be no combination.

Thus, Applicant respectfully submits that independent Claims 1, 14, 22, and 25 are distinguishable over the cited references in any combination, and the corresponding dependent Claims 2-11, 13, 15-21, and 23-24 are also distinguishable for at least the same reasons. Applicant respectfully requests that the rejection under 35 U.S.C. § 103(a) of Claims 1-11 and 13-25 be withdrawn.

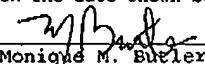
Accordingly, Applicant respectfully submits that Claims 1-11 and 13-25 are in proper form for allowance. Reconsideration and withdrawal of the rejection is respectfully requested and a timely Notice of Allowance is solicited.

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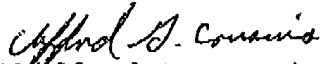
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If there are any questions regarding any aspect of the application, please call the undersigned at (949) 752-7040.

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